#16

UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of

PAUSTIAN et al.

Serial No.: 09/973,005 **Art Unit: 3644**

Filed: October 10, 2001 **Examiner: S. Holzen**

For: RAPID DEPLOYMENT OF TROOPS AND CARGO

APPEAL BRIEF

To the Commissioner of Patents and Trademarks

Sir:

REAL PARTY IN INTEREST

The real party in interest in the above-identified case is CERBERUS INSTITUTE FOR RESEARCH AND DEVELOPMENT, INC., by virtue of an assignment recorded on reel 012240 frame 0471, on October 10, 2001.

RELATED APPEALS AND INTERFERENCES

No other related appeals or interferences are pending.

STATUS OF CLAIMS

Claims 1-52 were finally rejected over art of record.

A copy of the appealed claims is appended hereto in the Appendix.

STATUS OF AMENDMENTS

No amendments were filed after the final rejection.

SUMMARY OF THE INVENTION

The invention (Specification pages 5-9; Figures 1-17) relates to device for rapidly deploying troops, cargo and/or personnel. In Figure 1, tilt-rotor aircraft 1 is provided with a landing tube 10 of the present invention. Troops 11 exit the tilt-rotor aircraft 1 through tube 10. Flexible retarders 13 within the tube 10 retard the gravitational descent of the troops which leave the aircraft ready for the combat action. (specification page 5, lines 4-8, Figure 1).

As shown in Figure 2, a heavy-lift helicopter employs a tube 10 with retarders 13 for dropping cargo 17 which falls under the influence of gravity through the tube 10, impacting and deforming the soft retarders 13. The undamaged cargo 17 exits the bottom of the tube. (specification page 5, lines 9-13, Figure 2).

As shown in Figure 3, tube 10 may be released from the helicopter 15 after the completion of the cargo drop or troop deployment. Alternatively, the tube may be mechanically raised back into the helicopter 15. (specification page 5, lines 13-14-17, Figure 3).

As shown in Figure 4, the gravity retarder tube 10 may be affixed to a cargo opening 19 of a heavy-lift helicopter 15. Troops 11 jump into the descent-retarding tube 10 and exit the

bottom 21 of the tube in combat-ready condition. (specification page 5, lines 18-21, Figure 4).

Figure 5 shows the use of the gravitational retarding tube 10 on a fixed wing aircraft 23 to deposit cargo 17 or troops 11 on the ground 25 during a low level, low speed flight. Cargo alone may be dropped at a higher speed. (specification page 5, lines 22-25, Figure 5).

Figure 6 shows a tilt-rotor aircraft 1 moving slowly forward and dragging a descent tube 31 at an angle. The tube 31 uses the retardation technology described in detail in United States Patent 5,620,058, the entirety of which is incorporated herein by reference. The troops 11 hit a cushion or inflatable ramp 27 connected to the bottom of the tube 10. The present invention as shown in Figure 6, is preferred for use in troop insertions and is usable in high wind states in limited reception areas with forest canopies and under hostile fire. Using the present invention, it is possible for troops to enter combat environments standing up with weapons ready while having armor protection at their rear at the moment of insertion. (specification page 6, lines 12-24, Figure 6).

Figure 7 shows a detail of the tube 31 shown in Figure 6. Preferably the tube 31 has a stiffener extruding spine 35 which is inflated to rigidity. A Kevlar exterior armor section 37 is provided on the front portion 39 of the tube 31. The rear section 41 of the tube may be left without the Kevlar armor protection. The Kevlar armor protection may surround the tube.

The bottom of the stiffener extruding spine 35 is provided with a flexible hinge 43 to which the inflated ramp 33 is connected. In a preferred embodiment, the inflated ramp has front and rear sections 45 and 47 which are interconnected 49 to provide flexibility when landing in rough terrain. (specification page 7, lines 1-10, Figure 7).

Figure 8 shows a cross-section of a preferred tube with a stiffener extruding spine 35 shown inside the Kevlar armored coating 37. Inflatable stabilizing winglets 61 are added at exterior sides of tube 41 to provide stability during deployment at speeds. (specification page 8, lines 6-10, Figure 8).

Figures 9, 10 and 11 show stiffener extruding spines telescoped. The spines are held in a storage container 63 which is attached to the aircraft. Retraction is provided via powered rollers 65 which engage outer surfaces of the spine sections. Spine sections 67 are telescoped as shown in Figures 10 and 11. (specification page 8, lines 11-15, Figures 9-11).

Figure 9 shows the deflated life step tube 41 which is packaged for release. Upon release of the tube 41, the spine sections 67 slide into the tube or into a long tube within the tube by gravity, by driving in an outward direction by the powered rollers and belt system 65 or preferably by internal pneumatic or hydraulic pressure. The pneumatic pressure may be supplied by rapidly combusting gases as in the case of automotive airbag deployments. (specification page 8, lines 16-23, Figures 9-11).

In one preferred embodiment, the stiffener extruding spine has about fifteen segments decreasing in diameter. Each segment is about two meters in length. The structure is basically telescoping pistons which are driven by conventional hydraulic or air pump or air extension systems or by rapidly expanding gas generation systems.

Preferably, the tube is a round tube about one and a half meters in diameter. The tube may have shaped cross-sections of any shape, such as but not limited to, round, ovoid, etc. The Kevlar coating 37 covers the forward side of the tube. The stiffener extruding spine slides within a small tube at the front of the larger tube 41. Preferred tilt-rotor aircraft used with the present invention as shown in Figures 12 and 13. The plane is operated by a crew of two and carries twenty-four troops with a fourteen ton troop and cargo capacity, for example. The aircraft is operable with one rotor. (specification page 9, lines 4-13, Figures 12-13).

Figure 14 schematically shows the preferred tilt-rotor aircraft 1 flying at slow speed or hovering. Figure 15 shows rapid deployment of troops 11 through two retarder tubes 10. Figure 16 shows a heavy-lift helicopter 15 deploying troops 11 through a different descent retarding tube 41. Figure 17 shows a heavy lift helicopter 15 deploying troops through a gravity descent retarding tube 10. (specification page 9, lines 14-20, Figures 14-17).

ISSUES

Copies of the previously filed oath and declaration, along with the mailroom receipt showing date of filing, are being concurrently filed under separate cover in response to paragraphs 1 and 2 on page 2 of the final office action.

The only remaining issue:

Whether claims 1-47 and 48-52 are patentable under 35 U.S.C. 103(a) over Welsch (US Patent 3,358,950) in view of Forrester (US Patent 5,620,058)?

GROUPING OF CLAIMS

The claims do not stand or fall together.

ARGUMENTS

The present claims are patentable under 35 U.S.C. 103(a).

In considering the patentability of the present invention, it is requested that the Board consider the invention as a whole, consider the scope and content of the prior art as a whole, consider the differences between the claims at issue and the prior art, and consider the level of ordinary skill in the art to which the invention pertains at the time the invention was made. **Graham v. John Deere Co., 148 USPQ 459, 467 (1966).**

THE INVENTION AS A WHOLE

The invention considered as a whole is best described by the appended claims.

PRIOR ART AS A WHOLE

The prior art to which the invention pertains is typified by the references of record.

DIFFERENCES BETWEEN THE INVENTION AND THE PRIOR ART

Each of the present claims defines unique features and each is individually patentable over the prior art.

The test in reviewing rejections under 35 U.S.C. 103 in which the examiner has relied on teachings of several references, is whether references, viewed individually and collectively, would have suggested claimed invention to a person possessing ordinary skill in the art, and citing references which merely indicate that isolated elements and/or features recited in the claims are known is not a sufficient basis for concluding that combination of the claimed elements would have been obvious. **Ex parte Hiyamizu, 10 USPQ2d 1393-1395 (Board of Patent Appeals and Inter., 1988); In re Kaslow, 217 USPQ 1089 (Fed. Cir. 1983); In re Deminski, 230 USPQ 313 (Fed. Cir. 1986).**

Claims 1-47 and 48-52 are patentable under 35 U.S.C. 103(a) over Welsch (3,358,950) and Forrester (5,620,058).

Welsch relates to a vertically collapsible or retractable passage means 3 for hovering aircraft 1. The lower end 3a of the passage means terminates such that it can be located over vegetation. Passage means 3 has wall means with plural frusto-conical sections 4. Top section 4a has an annular flange 5 that

rests on a rim 6 of the floor opening 7 of the helicopter 1. Eyelets 8 are provided on each frusto-conical section with recesses in floor rim 6 for allowing the sections to be converged into the helicopter or separated downwards from the floor opening 7. Chains or cables 9 hold the sections 4 extended from the helicopter floor. Chains or cables 10 attached to the section retract the passage into the helicopter floor opening 7. Pulleys 14 mounted on roofs 15 help retract the chains 10 and sections attached thereto. A winch is connected to chains 10.

Welsch further provides extensible support 17 extending through the passage 16 in the passage means 3. Support 17 is attached to the top wall 12 of the aircraft 1. Support 17 is coaxial with the sections 4 terminating at the lower end of the passage means 3. Support 17 has telescoping tubular members with a cable 22 running through the center of the members and being attached to a pulley inside the helicopter 1. Members 17 have progressively increasing diameters towards the lower end of the sections 4, with the lowest member having greatest diameter.

Welsch has resiliently biased gripping means with gripping units 27, 28 which are used to lower cargo 26. Hooks 29 with enlarged ends 30 are disposed in housing 32 which is secured to cargo 26 by straps 35. Hooks 29 and abutment 34 of gripping units 27, 28 grip opposite sides of sections 17 as cargo 26 slides down along the supports 17. Springs in units 27, 28 increase the gripping on support 17 to decelerate the falling

cargo. Support 17 may also be used as a slide pole to allow troops to slide down.

Forrester relates to an evacuation system with an inflatable descent tube 3 having plural entry ports 21 for attaching to an elevator shaft or side of a building. Energy absorption structures 5, 7, 11, inside the tube retard fall rate and an inflatable exit ramp 17 at the bottom of the tube cushions falling evacuees. Forrester teaches that having a single entry port 21 has limitations which are overcome by having multiple entry ports (see, for example, column 7, lines 15-25).

Welsch and Forrester do not teach all the claimed features. Claim 1 describes a rapid deployment system comprising an aircraft, at least one inflatable landing tube coupled to the aircraft, the at least one landing tube comprising an inner surface, an outer surface, a top end and an open bottom end, which is not taught or suggested by Welsch and Forrester.

Nothing in the references, either singly or in combination, teaches or suggests the claimed features. Therefore, the references cannot anticipate nor render obvious the present invention as claimed.

In deciding that a novel combination would have been obvious, there must be supporting teaching in the prior art. There is no suggestion or motivation in the prior art to combine the elements as done by the present invention and hence the claims cannot be rendered obvious. **In re Newell, 13 USPQ2d 1248, 1250 (CAFC, 1989).**

Claim 1 further defines an inflatable exit slide positioned at the open bottom end of the landing tube, an air source connected to the landing tube and the exit slide for inflating the landing tube and the slide to an optimum pressure, which is not suggested by the references. Plural connectors are positioned on the landing tube for coupling the landing tube to the aircraft, at least one entry port leading into the landing tube, and plural flexible retarders extending inward from the inner surface of the landing tube for retarding gravitational descent of cargo and personnel from the aircraft, which is not taught nor suggested by the references.

Welsch has a permanently installed passage means 3 and support 17 and Forrester has an inflatable tube 3 with several entry ports 21 for evacuating buildings and the like. Nothing in the references teaches or suggests an inflatable tube with connectors that can be coupled to aircraft. Nothing in the references suggest a combination as proposed by the Examiner.

In **In re Fine, 5 USPQ2d 1596, 1599 (Fed. Cir 1988)**, the Court observed:

> "Because neither [reference], alone or in combination, suggests the claimed invention, the Board erred in affirming the Examiner's conclusion that it would have been obvious to substitute the [secondary reference features] in the [primary system]. The [references] disclose, at most, that one skilled in the art might find it obvious to try the claimed invention. But whether a particular combination might be 'obvious to try' is not a legitimate test of patentability. **In re Geiger, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987); In re Goodwin, 198 USPQ 1, 3 (CCPA 1978).**

Thus, there is no prima facie case of obviousness with respect to any of the claims.

Claim 48 describes a method for rapid deployment from aircraft comprising installing a tube having internal flexible retarders and exit ramps on an aircraft, activating gas generators connected to the tube, inflating the tube, the internal flexible retarders and the exit ramps with gas delivered from the activated gas generators, entering the tube through an exit port in the aircraft communicating with an entry port in the tube, deploying down the tube, impacting the internal flexible retarders extending inward from an inner surface of the tube, exiting the tube, sliding down the exit ramp, and landing ready for combat from the tube. Welsch and Forrester do not teach nor suggest those claimed features.

As previously pointed out Welsch relates to a permanently attached passage means 3 and forrester relates to a building evacuation system. Nothing in the two references suggest a combination nor provide a motivation to combine the two teachings. In fact, the reference teach away from a combination because Welsch requires that the passage means be enclosed whereas Forrester advocates plural entry ports. Nothing in the references teaches, suggests or motivates one of ordinary skill in the art to combine the references in the manner proposed by the Examiner. Hindsight reconstruction forms the only basis for the Examiner's rejection which is inappropriate for an obviousness inquiry.

"It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings

of the prior art so that the claimed invention is rendered obvious." In re Fritch, 23 USPQ2d 1783, 1784 (CAFC, August 1992), quoting from In re Gorman, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). "This court has previously stated that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." **Id.** quoting from In re Fine, 5 USPQ2d 1600 (CAFC, 1988).

The Federal Circuit has held that the patent office is obligated to make necessary findings and to provide an administrative record showing the evidence on which the findings are based, accompanied by the agency's reasoning in reaching its conclusion. In re Zurko, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). The decision "must be justified within the four corners of the record." In re Gartside, 53 USPQ2d 1769, 1774 (Fed. Cir. 2000). The Examiner has neither made the necessary findings nor provided any reasoning for the arbitrary conclusion of obviousness even though the references do not teach or suggest the claimed features.

Dependent claims 2-47 are patentable under 35 U.S.C. 103(a) over Welsch (3,358,950) and Forrester (5,620,058).

The Examiner has made a novel statutory rejection for claims 2-47. Page 3, paragraph 2 of the office action reads:

> **"Re - Claims 2-47 are rejected under 35 U.S.C. 103(a) as being clearly anticipated over Welsch et al in view of Forrester."** (emphasis supplied)

Applicant is unable to comprehend this rejection. If the rejection is based on 35 U.S.C. 103(a) over a combination of Welsch and Forrester then the claims cannot be "clearly anticipated" by the two references. If the claims are indeed "clearly anticipated" then the statute "35 U.S.C. 103(a)" is inapplicable. Besides, there cannot be two references that can be relied on for any anticipation rejection. Applicant is unable to address such ambiguity because it would be mere speculation to decide the Examiner's clear intent in the rejections of record.

If examination at the initial stage does not produce a prima facie case of unpatentability, then without more the applicant is entitled to grant of the patent. In re Oetiker, 25 USPQ2d 1443, 1447 (Fed. Cir. 1992) citing In re Grabiak, 226 USPQ 870, 873 (Fed. Cir. 1985).

In fact, the office action does not provide any basis for the rejection of each of the features in every dependent claim and therefore Applicant is unable to determine the Examiner's basis for the rejection of each of the claims to adequately rebut the rejections. Therefore, as dictated by Oetiker "without more applicant is entitled to grant of the patent."

Dependent claims 49-52 are patentable under 35 U.S.C. 103(a) over Welsch (3,358,950) and Forrester (5,620,058).

The Examiner has made a novel statutory rejection for claims 49-52. Page 3, paragraph 4 of the office action reads:

> **"Re - Claims 49 - 52 are rejected under 35 U.S.C. 103(a) as being clearly anticipated over Welsch et al in view of Forrester."** (emphasis supplied)

Applicant is unable to comprehend this rejection. If the rejection is based on 35 U.S.C. 103(a) over a combination of Welsch and Forrester then the claims cannot be "clearly anticipated" by the two references. If the claims are indeed "clearly anticipated" then the statute "35 U.S.C. 103(a)" is inapplicable. Besides, there cannot be two references that can be relied on for any anticipation rejection. Applicant is unable to address such ambiguity because it would be mere speculation to decide the Examiner's clear intent in the rejections of record.

> **The examiner cannot sit mum, leaving the applicant to shoot arrows into the dark hoping to somehow hit a secret objection harbored by the examiner. The 'prima facie case' notion ... was intended to leave no doubt among examiners that they must state clearly and specifically any objections (the prima facie case) to patentability, and give the applicant fair opportunity to meet those objections ... the concept serves to level the playing field and reduces the likelihood of administrative arbitrariness.** (emphasis added) In re Oetiker, 25 USPQ2d 1443, 1447 (Fed. Cir. 1992) (Plager, J., concurring); see In re Piasecki, 233, USPQ 785, 788 (Fed. Cir. 1984).

LEVEL OF ORDINARY SKILL IN THE ART

A person having ordinary skill in the art is an artisan being taught the reference teachings.

SUMMARY

When considering the present invention as a whole and the prior art to which the invention pertains as a whole, when considering the differences between the present invention and the

prior art, and when considering the level of ordinary skill in the art to which the invention pertains, it is clear that the invention would not have been obvious under 35 U.S.C. 103(a) to a person having ordinary skill in the art at the time the invention was made.

CONCLUSION

Reversal of the Examiner and allowance of all the claims are respectfully requested.

Respectfully,

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June 16, 2003

APPENDIX

Appealed Claims

1. A rapid deployment system comprising an aircraft, at least one inflatable landing tube coupled to the aircraft, the at least one landing tube comprising an inner surface, an outer surface, a top end and an open bottom end, an inflatable exit slide positioned at the open bottom end of the landing tube, an air source connected to the landing tube and the exit slide for inflating the landing tube and the slide to an optimum pressure, and plural connectors positioned on the landing tube for coupling the landing tube to the aircraft, at least one entry port leading into the landing tube, and plural flexible retarders extending inward from the inner surface of the landing tube for retarding gravitational descent of cargo and personnel from the aircraft.

2. The system of claim 1, wherein the landing tube comprises multiple tubular segments connected to each other to form a continuous descent tube.

3. The system of claim 1, wherein the connectors are selected from the group consisting of bolts, adhesives, pitons and drilled holes filled with solidifying compounds.

4. The system of claim 1, wherein the landing tube is connected to an exit port of the aircraft, and wherein the at least one entry port of the landing tube is proximal the exit port of the aircraft.

5. The system of claim 4, wherein the landing tube is free-flowing and detachable from the aircraft.

6. The system of claim 1, further comprising a spine along the landing tube, the spine being retractable telescopically allowing for the landing tube to be retracted within the aircraft for storing and deployment as needed.

7. The system of claim 4, wherein the landing tube is connected to exterior edges of the exit port of the aircraft, and wherein the entry port further comprises a window coaming adapter positioned around the exterior edges and a membrane carried by and extending between sides of the adapter, and wherein the membrane expands with the landing tube as the landing tube is inflated.

8. The system of claim 7, wherein the membrane comprises multiple layers and expansion cells between adjacent layers for allowing independent expansion of the layers.

9. The system of claim 4, wherein the exit port of the aircraft is selected from a group consisting of cargo openings, personnel exits, passenger exits, and combinations thereof.

10. The system of claim 7, wherein the entry port of the landing tube has a first shield positioned behind the membrane and connected to the aircraft for protecting the membrane, the shield having a first arm and a second arm, the arms lying in a straight line when the landing tube is inactivated and separating and swinging outward from each other when the landing tube is activated.

11. The system of claim 10, further comprising a second shield extending between edges of the exit port such that the

membrane is sandwiched between the first shield and the second shield.

12. The system of claim 10, further comprising an override lock positioned on the first shield to prevent the first shield from opening automatically.

13. The system of claim 7, further comprising ribs positioned in the middle layer of the membrane to assist in expansion of the membrane and to provide form and rigidity to the membrane once the system is deployed, and wherein the ribs are flexible in a horizontal plane and rigid in a vertical plane.

14. The system of claim 13, further comprising reinforced panels connected to the ribs for vertically linking the ribs.

15. The system of claim 13, further comprising wall channels positioned in the exit port for holding the membrane and the ribs.

16. The system of claim 13, further comprising spring loaded ratchet lock mechanisms positioned near the ribs, and wherein each rib has a joint at a center of the rib and a locking groove for catching the spring loaded ratchet lock mechanisms.

17. The system of claim 13, wherein the landing tube, the membrane and the ribs have shaped cross-sections when fully inflated.

18. The system of claim 1, wherein the flexible retarders extend inward from the inner surface of the landing tube and are positioned such that those descending remain along a central

region of the landing tube and such that the descent has reducing velocities.

19. The system of claim 18, wherein the flexible retarders comprise diverting slopes on a first side of the landing tube, bouncing bulges on a second side of the landing tube which is opposite the first side, cushions extending along sides of the landing tube between the bouncing bulges and diverting slopes, and friction assistors on the cushions.

20. The system of claim 19, wherein the diverting slopes and the bouncing bulges alternate from a front wall of the landing tube to a back wall of the landing tube along entire lengths of the landing tube.

21. The system of claim 19, further comprising flapper valves on the flexible retarders for absorbing excess energy of those descending and for discharging air from the structures.

22. The system of claim 19, wherein the diverting slopes comprise deflector ramps connected to the landing tube and deflector curtains extending from the deflector ramps.

23. The system of claim 1, further comprising a release bar extending from the tube at the entry port to facilitate entry into the inflated tube.

24. The system of claim 19, wherein the bouncing bulges connected to inner surfaces of the tube comprise an inflated safety core and friction points extending from the core.

25. The system of claim 19, wherein the friction assistors have multiple breakaway cushion quills, and wherein each cushion

quill further comprises a friction strand, an inflated cushion connected to the strand, and a breakaway retention and inflation point connected to the inflated cushion.

26. The system of claim 1, wherein the exit slide comprises an inflatable exit ramp.

27. The system of claim 26, further comprising an inflated pendulum barrier extending from the bottom end of the tube toward the exit ramp.

28. The system of claim 1, wherein the exit ramp comprises interconnected front and rear sections to provide flexibility when landing in rough terrain.

29. The system of claim 6, wherein the spine comprises stiffener extruding spine sections inside the landing tube with inflatable stabilizing winglets on exterior sides of the landing tube to provide stability during deployment at speeds.

30. The system of claim 29, wherein the stiffener extruding spine sections are telescopically disposed.

31. The system of claim 30, further comprising a storage container on the aircraft for storing the spines.

32. The system of claim 30, further comprising powered rollers and coupled belts engaging outer surfaces of the sections of the spines for telescopically retracting the spines.

33. The system of claim 30, wherein the spine sections are deployable by gravity within the landing tube.

34. The system of claim 33, further comprising drivers for deploying the spine sections.

35. The system of claim 34, wherein the drivers are pneumatic or hydraulic pressure drivers.

36. The system of claim 35, wherein the pneumatic pressure driver comprises rapidly combusting gases.

37. The system of claim 30, wherein the spine sections comprise plural segments in decreasing diameter.

38. The system of claim 30, further comprising a flexible hinge on the spine at the bottom end of the tube for connecting the spine and the exit slide.

39. The system of claim 1, further comprising slide smocks for covering the cargo and the personnel to reduce possibility of snags during descent.

40. The system of claim 39, wherein the slide smocks line the inner surface of the tube for easy sliding during descent.

41. The system of claim 39, wherein the slide smocks are of friction reducing material removable as desired.

42. The system of claim 1, wherein the air source is a gas generator having a monopropellant generator, a control unit connected to the monopropellant generator for controlling the generator, an automatic valve connected to the monopropellant generator and to the tube, and a temporary expanding pressure device connected to the automatic valve.

43. The system of claim 18, wherein the flexible retarders are removably attached to the inner surface of the landing tube.

44. The system of claim 1, further comprising a shield on the landing tube.

45. The system of claim 44, wherein the shield is a Kevlar shield.

46. The system of claim 45, wherein the Kevlar shield is an exterior armor on a front portion of landing tube.

47. The system of claim 45, wherein the Kevlar shield is an exterior armor surrounding the landing tube.

48. A method for rapid deployment from aircraft comprising installing a tube having internal flexible retarders and exit ramps on an aircraft, activating gas generators connected to the tube, inflating the tube, the internal flexible retarders and the exit ramps with gas delivered from the activated gas generators, entering the tube through an exit port in the aircraft communicating with an entry port in the tube, deploying down the tube, impacting the internal flexible retarders extending inward from an inner surface of the tube, exiting the tube, sliding down the exit ramp, and landing ready for combat from the tube.

49. The method of claim 48, wherein installing the tube includes installing the tube along an opening of the aircraft.

50. The method of claim 49, wherein the deploying comprises deploying cargo.

51. The method of claim 48, wherein the deploying comprises deploying troops.

52. The method of claim 48, wherein the impacting comprises impacting systematically on the flexible retarders and wherein the landing comprises landing upright from the tube.